REMARKS

Claims 1 and 3-19 are pending. Claims 1 and 3-7 have been amended, claim 2 has been cancelled, and claims 11-19 are newly added. No new matter has been introduced by the amendment.

Rejections Under 35 U.S.C. 112

Claims 3, 5, and 7 were rejected under 35 U.S.C. 112, second paragraph. Claims 3, 5, and 7 have been amended to provide sufficient antecedent basis from claim 1. Applicants respectfully request withdrawal of these rejections.

Rejection Under 35 U.S.C. 102

Claims 1 and 6-9 were rejected under 35 U.S.C. 102(e) as being anticipated by Tumer et al. (U.S. Patent Application Publication No. 2003/0105397) ("Tumer"). Claim 10 was rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tumer. These rejections are overcome in view of the amendment of independent claim 1, together with the following remarks.

Claim 1 has been amended to recite a device for processing a detector current supplied by a particle detector and a unit for reducing a fluctuating component of background noise present in the detector current and providing a treated detector current. Claim 1 also recites that the unit comprises a converter for associating the treated detector current with a treated voltage signal from a threshold trigger. The threshold trigger recited in claim 1 passes the intermediate voltage signal when the intermediate voltage signal exceeds a first predetermined threshold and prevents the intermediate voltage signal from passing when the intermediate voltage signal falls below a second predetermined threshold. The threshold trigger also provides a treated voltage signal. Claim 1 further recites an integrator for measuring the total charge transported by the treated detector current for a predetermined time interval.

Applicants assert that the device of claim 1 is not suggested or disclosed by Tumer. Tumer fails to teach or suggest a threshold trigger that passes an intermediate voltage signal when the intermediate voltage signal exceeds a first predetermined threshold and prevents the intermediate voltage signal from passing when the intermediate voltage signal falls below a second predetermined threshold, as recited in claim 1.

Instead, Tumer discloses a discriminator 143 that produces a HIT signal if an output voltage from amplifier 133 exceeds a voltage supplied to a threshold input 142. (Tumer, ¶ 0080). Thus, Tumer does not disclose passing or preventing an intermediate voltage signal depending on the intermediate voltage signal relative to first and second predetermined thresholds, respectively, as recited in claim 1. Tumer only produces a HIT signal if an output voltage exceeds a single voltage threshold. (Tumer, ¶ 0080).

Furthermore, Tumer fails to teach or suggest an integrator for measuring the total charge transported by the treated detector current for a predetermined time interval, as recited in claim 1. Instead, Tumer discloses measuring the energy of a detected positron emission with an oscilloscope 127 based on an output of the amplifier 126, where the oscilloscope 127 is triggered by an output of the discriminator 125. (Tumer, Fig. 11, ¶¶ 0087, 0100-0105, 0122, 0130, 0133). Thus, Tumer does not disclose an integrator for measuring the total charge transported by the treated detector current, where the treated detector current is derived from a treated voltage signal from the threshold trigger. The integration disclosed in Tumer by the oscilloscope 127 is performed on the output of the amplifier 126, not the output of the discriminator 125. (Tumer, Fig. 11, ¶ 0087, 0100-0105). The output of the discriminator 125 merely triggers the oscilloscope 127, and energy is measured on the basis of the output of the amplifier 126. (Tumer, ¶¶ 0100-105, 0122).

Independent claim 1 is therefore allowable for at least the reasons above. Claims 6-10 are allowable in view of the amendment and remarks pertaining to claim 1 from which they depend.

Rejection Under 35 U.S.C. 103(a)

Claims 2-5 and 10 were rejected under 35 U.S.C. 103(a) as being unpatentable over Tumer in view of Lakshmikumar (U.S. Patent No. 5,619,128). The rejection of claim 2 is now moot in view of its cancellation.

The Office Action admits that Tumer does not disclose converting a voltage into a current, but asserts that Lakshmikumar shows this feature. (Office Action, page 4). Claim 1 recites a converter for associating said treated detector current with said treated voltage signal. Applicants respectfully submit that one skilled in the art would not combine Lakshmikumar with Tumer because they are non-analogous prior art since Lakshmikumar does not deal with particle detection, as Tumer does. Furthermore, Applicants respectfully submit that one skilled in the art would not have been motivated to modify the circuit of Tumer to include a voltage to current converter. For example, the HIT signal generated by the discriminator 143 in Tumer is provided to a coincidence logic 25 that may produce a sample/hold signal if a valid positron emission event is detected. (Tumer, ¶¶ 0074, 0081). There is no circuit element disclosed in Tumer in communication with the discriminator 143 that uses current and would therefore necessitate use of a voltage to current converter.

Claims 3-5 and 10 are allowable in view of the amendment and remarks pertaining to claim 1 from which they depend.

New Claims

Claims 11-19 are newly added to the application in order that the applicants may more fully claim the subject matter of their invention. Claims 11-13 are allowable in view of the amendment and remarks pertaining to claim 1 from which they depend.

New independent claim 14 recites a device for processing a detector signal derived from a particle detector that includes a unit for reducing a fluctuating component of background noise present in the detector signal. The device also includes an integrator for measuring the total charge transported by the input signal from the unit for a predetermined time interval.

The unit includes a threshold trigger for allowing current to pass when the output voltage associated with an input current of the detector signal exceeds a first predetermined threshold. The threshold trigger also prevents current from passing when the output voltage falls below a second predetermined threshold. The unit further includes a converter for associating the input signal produced by the unit with an output current of the threshold trigger.

Applicants assert that claim 14 is allowable over the cited references.

New independent claim 15 recites a method for processing a detector current signal derived from a particle detector. The method includes sensing a detector current and associating an intermediate voltage with a current derived from the detector current. The method also includes applying the intermediate voltage to a switch that allows the intermediate voltage to pass when the intermediate voltage exceeds a first predetermined threshold value and prevents the intermediate voltage from passing when the intermediate voltage falls below a second predetermined threshold value. The switch provides an output switch voltage. The method further includes associating a processed current with the output switch voltage, and integrating the total charge transported by the processed current.

Applicants assert that the cited references fail to teach or suggest allowing an intermediate voltage to pass when the intermediate voltage exceeds a first predetermined threshold and prevent the intermediate voltage from passing when the intermediate voltage falls below a second predetermined voltage, as recited in claim 15.

Claims 16-19 are allowable in view of the remarks pertaining to claim 15 from which they depend.

The claims at issue distinguish over the cited references and are in condition for allowance. Accordingly, such allowance is now earnestly requested.

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